

EVALUATION OF THE EFFECT OF DIODE LASER 810NM ON THE DIFFUSION OF THE HYDROXYL IONS FROM CALCIUM HYDROXIDE INTRACANAL MEDICAMENT PASTE THROUGH THE DENTINAL TUBULES

(In Vitro Comparative Study)

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ABSTRACT:

Purpose: The main known benefits of calcium hydroxide in endodontology lies in the bactericidal, antimicrobial, and anti-inflammatory. Calcium hydroxide to be more effective, should be diffuse through the dentinal tubules. However, laser has a promising effect to enhance that by removing of the smear layer in the inner walls of root canals.

Aim: This study aimed to evaluate the effect of laser Diode 810nm on the dentine permeability for calcium hydroxide endodontic dressing. **Materials And Methods:** Fifty extracted lower first premolar teeth were prepared and randomly divided into two groups (A & B). The root canals of the group A were filled with calcium hydroxide medicament and in group B were filled with calcium hydroxide after irradiated with different laser output energies. Diode laser 810 nm wavelength was used in this study. Fiber optic 200 micrometer diameter is the delivery system to the root canal. The output laser energy were 1, 2,3, and 4 Jules. The frequency was 25Hz and the time was fixed in 30 second each root canal treatment. The fluencies were 0.3, 0.6, 0.9, 0.12 J/Cm². The apical foramen

and the coronal orifice for each samples was sealed and stored in glass tube containing 5ml of distil water, then the pH of the surrounding medium was measured at 1 Hour (H), 1Day (D), 1 Week (W), 2 Weeks, 3 Weeks to the both groups. **Result:** The level of pH in each group increased significantly with time, indicating that the hydroxyl ions were continuously diffused through the dentinal tubules to the surrounding medium. There was statistical significant difference between the two groups in the level of pH, that revealed there is increasing effect when using laser irradiation on the pH of the surrounding media of the root that filled by calcium hydroxide paste specially with 1 and 2 J. **Conclusion:** The using laser diode before calcium hydroxide paste will accelerate the alkalinity of the medium surrounding the root which was filled with the paste which means the laser is effect in the cleaning the dentinal tubules from the smear layer leading to increase the chance of the calcium hydroxide paste ions to flue out and increase the alkalinity of the surrounding media.

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